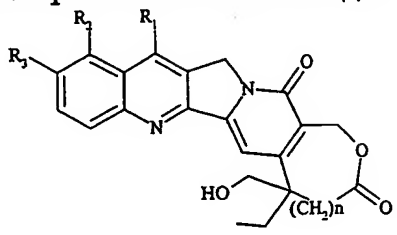
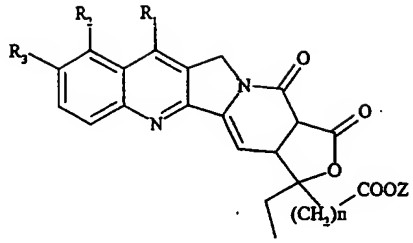
Claims

1. Compounds of formula (I) or formula (II)



(I)



(II)

where:

R_1 is hydrogen or a -C(R_5)=N-O-R_4 group, in which R_4 is hydrogen or a straight or branched C_1-C_5 alkyl or C_1-C_5 alkenyl group, or a C_3-C_{10} cycloalkyl group, or a straight or branched (C_3-C_{10}) cycloalkyl - (C_1-C_5) alkyl group, or a C_6-C_{14} aryl group, or a straight or branched (C_6-C_{14}) aryl - (C_1-C_5) alkyl group, or a heterocyclic group or a straight or branched heterocyclo - (C_1-C_5) alkyl group, said heterocyclic group containing at least one heteroatom selected from an atom of nitrogen, optionally substituted with an (C_1-C_5) alkyl group, and/or an atom of oxygen and/or of sulphur; said alkyl, alkenyl, cycloalkyl, cycloalkyl-alkyl, aryl, aryl-alkyl, heterocyclic or heterocyclo-alkyl groups can optionally be substituted with one or more groups selected from the group consisting of: halogen, hydroxy, C_1-C_5 alkyl, C_1-C_5 alkoxy, phenyl, cyano, nitro, and -NR_6R_7, where R_6 and R_7, which may be the same or different, are hydrogen, straight or branched (C_1-C_5) alkyl, the -COOH group or one of its pharmaceutically acceptable esters; or the -$CONR_8R_9$ group, where R_8 and R_9, which may be the same or different, are hydrogen, straight or branched (C_1-C_5) alkyl; or

R_4 is a (C_6-C_{10}) aroyl or (C_6-C_{10}) arylsulphonyl residue, optionally substituted with one or more groups selected from: halogen, hydroxy, straight or branched C_1-C_5 alkyl, straight or branched C_1-C_5 alkoxy, phenyl, cyano, nitro, -$NR_{10}R_{11}$, where R_{10} and R_{11}, which may be the same or different, are hydrogen, straight or branched C_1-C_5 alkyl; or:

R_4 is a polyaminoalkyl residue; or

R_4 is a glycosyl residue;
R_5 is hydrogen, straight or branched C_1-C_5 alkyl, straight or branched C_1-C_5 alkenyl, C_3-C_{10} cycloalkyl, straight or branched (C_3-C_{10}) cycloalkyl - (C_1-C_5) alkyl, C_6-C_{14} aryl, straight or branched (C_6-C_{14}) aryl - (C_1-C_5) alkyl;
R_2 and R_3, which may be the same or different, are hydrogen, hydroxy, straight or branched C_1-C_5 alkoxy;
n = 1 or 2,
Z is selected from hydrogen, straight or branched C_1-C_4 alkyl;
the N_1-oxides, the racemic mixtures, their individual enantiomers, their individual diastereoisomers, their mixtures, and their pharmaceutically acceptable salts, with the proviso that, in formula (I), R_1, R_2 and R_3 cannot be simultaneously hydrogen.

2. The compounds according to claim 1, in which, in formula (I), n is 1.

3. The compounds according to claim 1, in which, in formula (II), n is 1.

4. The compounds according to claim 2, selected from the group consisting of:
- R,S-7-methoxyiminomethyl-homocamptothecin;
- R,S-7-ethoxyiminomethyl-homocamptothecin;
- R,S-7-isopropoxyiminomethyl-homocamptothecin;
- R,S-7-(2-methylbutoxy)iminomethyl-homocamptothecin;
- R,S-7-(1-t-butoxy)iminomethyl-homocamptothecin;
- R,S-7-(4-hydroxybutoxy)iminomethyl-homocamptothecin;
- R,S-7- triphenylmethoxyiminomethyl-homocamptothecin;
- R,S-7-carboxymethoxyiminomethyl-homocamptothecin;
- R,S-7-aminoethoxyiminomethyl-homocamptothecin;
- R,S-7-(N,N-dimethylaminoethoxy)iminomethyl-homocamptothecin;
- R,S-7-allyloxyiminomethyl-homocamptothecin;
- R,S-7-cyclohexyloxyiminomethyl-homocamptothecin;
- R,S-7-cyclohexylmethoxyiminomethyl-homocamptothecin;

- R,S-7-cyclooctyloxyiminomethyl-homocamptothecin;
- R,S-7-cyclooctylmethoxyiminomethyl-homocamptothecin;
- R,S-7-benzyloxyiminomethyl-homocamptothecin;
- R,S-7-(benzyloxy)iminophenylmethyl-homocamptothecin;
- R,S-7-(1-benzyloxy)iminoethyl-homocamptothecin;
- R,S-7-(1-t-butoxy)iminoethyl-homocamptothecin;
- R,S-7-p-nitrobenzyloxyiminomethyl-homocamptothecin;
- R,S-7-p-methylbenzyloxyiminomethyl-homocamptothecin;
- R,S-7-pentafluorobenzyloxyiminomethyl-homocamptothecin;
- R,S-7-p-phenylbenzyloxyiminomethyl-homocamptothecin;
- R,S-7-(2,4-difluorobenzylmethoxy)iminomethyl-homocamptothecin;
- R,S-7-(4-t-butylphenylmethoxy)iminomethyl-homocamptothecin;
- R,S-7-(1-adamantyloxy)iminomethyl-homocamptothecin;
- R,S-7-(1-adamantylmethoxy)iminomethyl-homocamptothecin;
- R,S-7-(2-naphthalenyloxy)iminomethyl-homocamptothecin;
- R,S-7-(9-anthracenylmethoxy)iminomethyl-homocamptothecin;
- R,S-7-(6-uracyl)methoxyiminomethyl-homocamptothecin;
- R,S-7-(4-pyridil)methoxyiminomethyl-homocamptothecin;
- R,S-7-(2-thienyl)methoxyiminomethyl-homocamptothecin;
- R,S-7-[(N-methyl)-3-piperidinyl]methoxyiminomethyl-homocamptothecin;
- R,S-7-hydroxyiminophenylmethyl-homocamptothecin.

5. The compounds according to claim 3, selected from the group consisting of:

- {10-[(E)-(ter-butoxyimino)methyl]-3-ethyl-1,13-dioxo-11,13-dihydro-1H,3H-furo[3',4':6,7]indolizino[1,2-b]quinolin-3-yl}acetic acid
- (10-{(E)-[(benzyloxy)imino]methyl}-3-ethyl-1,13-dioxo-11,13-dihydro-1H,3H-furo[3',4':6,7]indolizino[1,2-b]quinolin-3-yl)acetic acid
- (3-ethyl-1,13-dioxo-11,13-dihydro-1H,3H-furo[3',4':6,7]
- indolizino[1,2-b]quinolin-3-yl)acetic acid
- ter-butylic ester of (3-ethyl-1,13-dioxo-11,13-dihydro-1H,3H-furo[3',4':6,7] indolizino[1,2-b]quinolin-3-yl)acetic acid.

6. Process for the preparation of formula (I) compounds according to claim 1 in which R_1 is hydrogen and R_2 and R_3 are as defined above, comprising:

a) eduction of the keto group in position 19 of the camptothecin, optionally substituted with the envisaged meanings of R_2 and R_3, to yield the 19,20-dihydroxy-derivative ;

b) reatment of the derivative obtained in step a) with periodate and acetic acid, to obtain the opening of the E ring;

c) eformatsky reaction on the derivative obtained in step b);

d) ormation of the E ring where n is 1 or 2.

7. Process for the preparation of formula (I) compounds according to claim 1, in which R_1 is a $-C(R_5)=N-O-R_4$ group and R_2, R_3, R_4 and R_5 are as defined above, comprising:

a) transformation of the camptothecin, optionally substituted with the envisaged meanings of R_2 and R_3, to 7-(di-methoxymethyl)camptothecin;

b) reduction of the keto group in position 19 of the 7-(di-methoxymethyl)camptothecin, to yield the derivative 19,20-dihydroxy;

c) treatment of the derivative obtained in step b) with periodate and acetic acid, to obtain the opening of the E ring;

d) Reformatsky reaction on the derivative obtained in step c);

e) treatment of the compound obtained in step d) with a formula R_4ONH_2 oxime and simultaneous formation of ring E where n is 1 or 2.

8. Process for the preparation of formula (II) compounds according to claim 1 in which R_1 is hydrogen and R_2 and R_3 are as defined above, comprising:

a) reduction of the keto group in position 19 of the camptothecin, optionally substituted with the envisaged meanings of R_2 and R_3, to yield the derivative 19,20-dihydroxy;

b) treatment of the derivative obtained in step a) with periodate and acetic acid, to obtain the opening of the E ring;

c) Reformatsky reaction on the derivative obtained in step b);

d) treatment of the derivative obtained in step c) with PDC with

formation of the E ring and, if so desired;

e) transformation of the Z group to hydrogen.

9. Process for the preparation of formula (II) compounds according to claim 1 in which R_1 is a $-C(R_5)=N-O-R_4$ group and R_2, R_3, R_4 and R_5 are as defined above, comprising:

a) transformation of the camptothecin, optionally substituted with the envisaged meanings of R_2 and R_3, to 7-(dimethoxymethyl)camptothecin;

b) reduction of the keto group in position 19 of the 7-(dimethoxymethyl)camptothecin, optionally substituted with the envisaged meanings of R_2 and R_3, to yield the derivative 19,20-dihydroxy;

c) treatment of the derivative obtained in step b) with periodate and acetic acid, to obtain the opening of the E ring;

c) Reformatsky reaction on the derivative obtained in step c);

d) treatment of the derivative obtained in step c) with PDC with formation of the E ring;

e) treatment of the compound obtained in step d) with an oxime of formula R_4ONH_2 and, if so desired,

f) transformation of the Z group to hydrogen.

10. 7-(dimethoxymethyl)camptothecin.

11. Use of 7-(dimethoxymethyl)camptothecin as an intermediate product in the process according to claims 7 and 9.

12. Compounds according to any of claims 1-5 as medicaments.

13. Pharmaceutical composition containing a therapeutically effective amount of at least one compound according to claims 1-5 in admixture with pharmaceutically acceptable vehicles and excipients.

14. Pharmaceutical composition containing a therapeutically effective amount of at least one compound according to claims 1-5 in admixture

with pharmaceutically acceptable vehicles and excipients and optionally in combination with another active ingredient.

15. Pharmaceutical composition according to claim 14, in which the other active ingredient is an anticancer agent.

16. Use of a compound according to claims 1-5, for the preparation of a medicament with topoisomerase I inhibiting activity.

17. The use according to claim 16 for the preparation of a medicament useful for the treatment of tumours.

18. The use according to claim 16 for the preparation of a medicament useful for the treatment of parasitic or viral infections.